CASE PRESENTATION

GIANT CORONARY ARTERY ANEURYSM FOLLOWING SIROLIMUS-ELUTING STENT IMPLANTATION

D S Gambhir
MD, DM, FAMS, FACC
CEO & Director of Cardiology, Kailash Heart Institute
NOIDA
CLINICAL PROFILE

- YG  •  56 Male  •  DM ⊗  •  Hypt ⊕
- CAD - Unstable Angina
- LVEF : 55%
- CAG (Nov 05’) : Single Vessel Disease
- Adhoc PTCA / Stent : Cypher Select (3x33mm) LAD
- Recurrent Angina After Five Months with ST-T Changes and Haemodynamic Instability
LEFT CORONARY ANGIOGRAM AFTER DEPLOYMENT OF DES

RAO VIEW

- Deployment of DES
  - Stent: Cypher
  - Size: 3.5x33mm
  - Pressure: 13 Atm
LEFT CORONARY ANGIOGRAM AFTER DEPLOYMENT OF DES

Deployment of DES
- Stent: Cypher
- Size: 3.5x33mm
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GIANT ANEURYSM OF LAD AFTER IMPLANTATION OF CHYPHER STENT

POST IMPLANTATION FOLLOW-UP COURSE

- Asymptomatic for 5 Months
- TMT after 2 Months of Implantation Negative
- Received Plavix, Aspirin, Statins and Beta-Blockers on Follow-up
GIANT ANEURYSM OF LAD AFTER IMPLANTATION OF CHYPHER STENT
FIVE MONTHS AFTER IMPLANTATION

- Developed Severe Chest Pain with Sweating
- Examination After Admission:
  - Sinus Tachycardia (Rate : 104 bpm)
  - Hypotension (BP : 80 mm Hg Systolic)
  - Mild LVF
  - New Onset MR
  - ECG : Junctional Rhythm with ST Depression in $V_1 \rightarrow V_5$
  - Trop-T : Negative
- Management:
  - Inotropes, UFH, Plavix, Aspirin, GPIIb/IIIa (Tirofiban)
PSEUDOANEURYSM OF LAD FOLLOWING CYPHER IMPLANTATION

SURGICAL FINDINGS

- Large Pseudoaneurysm Arising from Proximal LAD Between LAA and PA
- Large Rent in Proximal LAD on the Medial Wall of Aneurysmal Sac
PSEUDOANEURYSM OF LAD FOLLOWING CYPHER IMPLANTATION

OPERATIVE NOTES

- Sac Opened
- Stent Explanted
- Rent Along with Stented Segment of LAD Closed with Running Sutures
- Aneurysmal Sac Obliterated over Teflon Felt
- SVG Anastomosed to LAD and OM
- Procedure Done Under IABP Support
- Blood Cultures - Negative
CORONARY ARTERY ANEURYSM AFTER DES IMPLANTATION

PATHOPHYSIOLOGY

- Hypersensitivity / Inflammatory Reaction
  - Antirestenotic Drug
  - Polymer
  - Stent Platform
- Incomplete Endothelialization
- Late Acquired Incomplete Stent Apposition (8-10%)
### CORONARY ARTERY ANEURYSM AFTER DES
### INCIDENCE FROM RANDOMIZED TRIALS

Vessel Diameter 20% or More Compared with Reference Vessel Diameter on Follow-up

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<tr>
<th></th>
<th>BMS</th>
<th>DES</th>
<th>p</th>
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<tbody>
<tr>
<td>Incidence</td>
<td>1.1%</td>
<td>0.8%</td>
<td>0.512 (NS)</td>
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CORONARY ARTERY ANEURYSMS ASSOCIATED WITH DES vs BMS

<table>
<thead>
<tr>
<th>Study</th>
<th>DES n/N</th>
<th>BMS n/N</th>
<th>Odds ratio (95% CI)</th>
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<tbody>
<tr>
<td>SIRIUS (5)</td>
<td>2/350</td>
<td>4/351</td>
<td>0.499 (0.091, 2.740)</td>
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<tr>
<td>TAXUS II SR (31)</td>
<td>3/131</td>
<td>1/136</td>
<td>3.164 (0.325, 30.812)</td>
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<tr>
<td>TAXUS II MR (31)</td>
<td>1/135</td>
<td>3/134</td>
<td>0.326 (0.033, 3.173)</td>
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<tr>
<td>TAXUS IV (6)</td>
<td>2/292</td>
<td>2/267</td>
<td>0.914 (0.128, 6.533)</td>
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<tr>
<td>TAXUS V (32)</td>
<td>7/498</td>
<td>1/492</td>
<td>7.000 (0.858, 57.107)</td>
</tr>
<tr>
<td>TAXUS VI (33)</td>
<td>3/209</td>
<td>1/207</td>
<td>3.000 (0.310, 29.079)</td>
</tr>
<tr>
<td>Total</td>
<td>18/1615</td>
<td>12/1587</td>
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Test for heterogeneity:
X^2 = 6.335 (d.f. = 5), P = 0.275

Test for overall effect:
Z = 0.656, P = 0.512

Favors DES: 0.01 0.1 1 10 100
Favors BMS: 1.326 (0.571, 3.078)
CORONARY ARTERY ANEURYSM AFTER DES

DATA OUTSIDE RANDOMIZED TRIALS

- **Kachru et al** (AJC 2005; 96 Suppl 7A)
  - 0.2% out of 2408 DES
  - Routine Angiography Not Done in All

- **Rha et al** (AJC 2005; 96 Suppl 7A)
  - 1.7% at 6-Months Angiographic FU

- Case Reports in ‘Real World’ Lesions
  - 24 Cases Reported in World Literature
CORONARY ARTERY ANEURYSM AFTER DES FOR ‘REAL WORLD LESIONS’

CASE REPORTS (N = 24)

- **Age (Years)**: 32–75
- **M : F**: 14 : 10
- **Type of DES**
  - SES: 15 (62.5%)
  - PES: 9 (37.5%)
- **Target Vessel**
  - LAD: 14 (58%)
  - LCx: 4 (16.6%)
  - LMT: 2
  - RCA: 4 (6.6%)
- **Timing After DES**: 3 Days – 4 Years
CORONARY ARTERY ANEURYSMS

PROPOSED CLASSIFICATION

Type I
- Rapid Growth with Pseudoaneurysm Formation
- Generally Diagnosed within 4 Weeks
- Clinical Pericarditis

Type II
- Subacute / Chronic Formation
- Incidental Finding During Angiography
- Variable Presentation
  - ASx → Ch. Angina

Type III
- Mycotic / Infectious in Aetiology
- Presentation with PUO

Secondary to Arterial Injury Related to PTCA
Chronic Arterial Response to Stent / Polymer / Drug
Infection + Local Inmuno-Suppressive Effect of Drug

Aoki J. JACC Intv. 2008;1:14-2
PSEUDOANEURYSM OF CORONARY ARTERY AFTER IMPLANTATION OF DES

COMPLICATIONS

- Rupture → Tamponade → Death
- Stent Thrombosis → Distal Embolization
- Infection → Prolonged Fever
TREATMENT MODALITIES FOR ANEURYSM OF CORONARY ARTERY FOLLOWING DES

- **Percutaneous Intervention** (True Aneurysm)
  - Stent Graft
  - Coil Embolization
- **Surgical Treatment** (Pseudoaneurysm)
- Careful Follow-up with Repeat Angiogram after 4-6 Months
GIANT ANEURYSM OF LAD AFTER IMPLANTATION OF CYPHER STENT

FINAL DIAGNOSIS

- CAD Unstable Angina (ACS)
- PCI with Implantation of Cypher Stent
- Large Pseudoaneurysm of Proximal LAD Between LAA and PA
- Surgical Intervention
  - Obliteration of Aneurysm over Teflon Felt
  - SVG to LAD and OM
GIANT ANEURYSM OF LAD AFTER IMPLANTATION OF CYPHER STENT

CONCLUSION

- Coronary Artery Aneurysm after DES Rare but Well Reported Complication
- Precise Pathophysiology Not Known
- Diagnosis Most Often by Routine Angiography on Follow-up
- Pseudoaneurysm Presenting with Acute Chest Pain Potentially Life-Threatening Complication
- Immediate Surgical Management is the Treatment of Choice